

## CLAIMS

1. A power supply, comprising:

a supply inductor coupled to a first capacitor to form a first resonant circuit for  
5 generating a resonant waveform in a resonant operation, during a first portion of an operation cycle of said power supply;

a charge storage element for developing an output voltage to energize a load;

a rectifier coupled to said charge storage element and to said first resonant circuit and  
10 responsive to said resonant waveform for producing a first change of state in said rectifier, in accordance with said resonant waveform, at an end time of said operation cycle first portion, that causes said output voltage to be coupled back to said first resonant circuit and to interrupt said resonant operation;

15 a first sensor for sensing when said first change of state in said rectifier occurs;

a source of a supply current coupled to said rectifier and rectified in said rectifier to  
produce a rectified current that is coupled to said charge storage element to replenish a charge  
therein, during a second portion of said operation cycle; and

20

a switching transistor responsive to an output signal of said first sensor for coupling  
said supply current to said rectifier, after said first change of state in said rectifier occurs, and  
for decoupling said supply current from said rectifier, prior to an occurrence of said first  
change of state in said rectifier.

25

2. The power supply according to Claim 1, wherein said charge storage element  
comprises a filter capacitor for said output voltage.

3. The power supply according to Claim 1, wherein said rectifier comprises a two-  
30 terminal semiconductor.

4. The power supply according to Claim 1, wherein said first capacitor capacitively couples said supply current to said rectifier, and wherein said rectifier couples said output voltage back to said first capacitor to cease a current flow in said first capacitor, when said first change of state in said rectifier occurs.

5

5. The power supply according to Claim 4, wherein said first sensor senses when said current flow ceases in said first capacitor.

6. The power supply according to Claim 1, wherein said first capacitor capacitively couples said supply current to said rectifier, during said second portion of said operation cycle.

10

7. The power supply according to Claim 1, further comprising a second inductor coupled to said switching transistor and to a source of an input supply voltage for storing a current in said second inductor, during said operation cycle first portion, wherein said switching transistor enables said second inductor current to be coupled to said rectifier, during said operation cycle second portion and disables said inductor current from being coupled to said rectifier, during said operation cycle first portion.

15

8. The power supply according to Claim 7, wherein said second inductor current varies, during said operation cycle second portion, and wherein said rectifier is responsive to the variation in said second inductor current for producing, in accordance therewith, a second change of state in said rectifier, at an end time of said operation cycle second portion, that is opposite to said first change of state.

20

25

9. The power supply according to Claim 8, wherein after said second change of state occurs in said rectifier, a capacitance is coupled to at least one of said first and second inductors to form a second resonant circuit that causes a first voltage developed between a pair of main current conducting terminals of said switching transistor to vary in a resonant manner.

30

10. The power supply according to Claim 9, further comprising a second sensor for sensing when a first portion of a resonant cycle of said first voltage has elapsed, wherein said

switching transistor is responsive to an output signal of said second sensor to turn on said transistor when said first voltage developed between said pair of main current conducting terminals of said switching transistor is lower than when the resonant manner variation of said first voltage begins so as to reduce power dissipation during a state change in said transistor.

5

11. The power supply according to Claim 1, further comprising a source of an input supply voltage for generating said supply current and a second capacitor, wherein said second capacitor and said first capacitor are coupled in a current path of said supply current for isolating said load from said source of said input supply voltage, at frequencies lower than a

10

frequency of said operation cycle.